OBSERVATIONS & RECOMMENDATIONS

After reviewing data collected from **LAKE WINNISQUAM (Mohawk Island, Pot Island, Three Islands),** the program coordinators have made the following observations and recommendations:

The **Pot Island** monitoring group sampled the central deep spot and tributaries three times this summer. Thank you for your continued hard work sampling the lake/pond this season! As you know, with multiple sampling events each season, we will be able to more accurately detect changes in water quality. Keep up the good work!

The **Three Island** monitoring group sampled the northern deep spot once this summer. We would like to thank the group for sampling **once** this summer. However, we encourage your monitoring group to sample **additional** times each summer. Typically we recommend that monitoring groups sample **three times** per summer (once in **June**, **July**, and **August**). We understand that the number of sampling events you decide to conduct per summer will depend upon volunteer availability, and your monitoring group's water monitoring goals and funding availability. However, with a limited amount of data it is difficult to determine accurate and representative water quality trends. Since weather patterns and activity in the watershed can change throughout the summer, from year to year, and even from hour to hour during a rain event, it is a good idea to sample the lake/pond at least once per month over the course of the season. If you are having difficulty finding volunteers to help sample, or to pick-up or drop-off equipment at one of the laboratories, please give the VLAP Coordinator a call and we will try to help you work out an arrangement.

The **Mohawk Island** group did not sample the southern deep spot this summer. As discussed previously, we typically recommend that monitoring groups sample three times per summer (once in **June**, **July**, and **August**). If you are having difficulty finding volunteers to help sample, or to pick-up or drop-off equipment at one of the laboratories, please give the VLAP Coordinator a call and we will try to help you work out an arrangement.

There have been several projects that DES has been involved with along the shores and within the watershed of Lake Winnisquam in 2004. These projects involve Ahern State Park in Laconia and Hueber Drive/Route 3 in Belmont.

Ahern State Park, Laconia

On December 10, 2002, Department of Environmental Services (DES) personnel met with the City of Laconia and the Ahern State Park Advisory Committee to discuss the water quality at Ahern State Park Beach. As a result of that meeting, DES developed and carried out a water quality monitoring plan for Ahern State Park, both at the beach area and in the Governor Park Stream watershed in Summer 2003. The purpose of the monitoring was to identify and quantify sources of *E. coli* bacteria to the beach area.

During the Summer of 2003, DES conducted a sanitary survey of the Governor Park Stream watershed. In addition, DES conducted multiple rounds of dry weather and wet weather sampling. Potential bacteria sources were identified, documented, and mapped.

Sources of *E. coli* bacteria originating from the Lakes Region Correctional Facility grounds is the probable cause of water quality standard violations at Ahern State Park Beach and in Governor Park Stream during and immediately after stormwater runoff events. The primary suspected source is leakage and exfiltration from old clay sewer pipes.

DES anticipates that a Memorandum of Understanding on how to best advise the public when water quality at the Ahern State Park Beach does not meet State Water Quality Standards will be signed prior to the 2005 swimming season. This is necessary to protect public health until a permanent solution is in place. In addition, the US EPA has requested information from the Department of Corrections (DOC), part of which is to prepare and submit a plan with a schedule to evaluate and repair/replace the DOC's wastewater collection of portion of the collection system to ensure that wastewater discharges to the waterways are eliminated.

Hueber Drive, Belmont

A pond which directly discharges to Lake Winnisquam is located adjacent to the railroad tracks north of Dutile Shores Road. Due to runoff within the Huber Drive Brook subwatershed, sediment is transported through the pond and is discharged into the Lake.

Although the sediment is being generated by numerous sources, the New Hampshire Department of Transportation (DOT) agreed to work with DES to find a solution to correct the water quality violation. During the Summer of 2003, DES met with representatives of DOT to discuss potential design solutions. In September, 2004, representative from DOT and DES met to discuss the proposed road reconstruction and stormwater detention design. The proposed improvements include full reconstruction of Route 3 with granite curb and an associated closed drainage system. The design combines the off-site flow, with the new closed drainage system for Route 3, at the intersection of Old State Road. A carrying pipe is designed to outlet this drainage to a proposed water quality basin, located on a State-owned parcel of land, south of Hueber Drive. Right-of-Way access agreements still need to be worked out to allow the system to access the State-owned property. The intent of the basin is to provide treatment for the Route 3 (and adjacent parking areas) "first flush" drainage flow. The design will be incorporated into the second phase of the Route 3 reconstruction in Belmont.

Town Beach, Belmont

In addition to the Hueber Drive stormwater detention basin, DOT is designing a separate system to detain stormwater flows at the Belmont Town Beach associated with the remaining Route 3 reconstruction. The proposed detention area is located just south of the existing Town Beach Road, opposite the Route 3 intersection at the Laconia Bypass. The design proposal includes two basins, located on State-owned property to be hydraulically connected by twin 42" pipes and provide for first flush treatment. DES is currently reviewing the proposal to assure maximum stormwater treatment prior to discharging to Lake Winnisquam, adjacent to the Town Beach.

FIGURE INTERPRETATION

- **Figure 1 and Table 1:** The graphs in Figure 1 (Appendix A) show the historical and current year chlorophyll-a concentration in the water column. Table 1 (Appendix B) lists the maximum, minimum, and mean concentration for each sampling season that the lake/pond has been monitored through the program.

  Chlorophyll-a, a pigment found in plants, is an indicator of the algal abundance. Because algae are usually microscopic plants that contain chlorophyll-a, and are naturally found in lake ecosystems, the chlorophyll-a concentration measured in the water gives an estimation of the algal concentration or lake productivity. **The mean (average) summer chlorophyll-a concentration for New Hampshire's lakes and ponds is 7.02 mg/m^3.**

THREE ISLAND DEEP SPOT
The current year data (the top graph) show that the chlorophyll-a concentration in **August** was ***less than*** the state mean.

Overall, visual inspection of the historical data trend line (the bottom graph) shows a ***slightly variable*** in-lake chlorophyll-a trend since monitoring began. Specifically, the mean concentration has ***fluctuated between approximately 1.6 and 4 mg/m³*** since ***1987.*** *Please keep in mind that this trend is based on limited data since this deep spot has only been monitored once per year from 1995 to 2004. As this monitoring group expands its sampling program to include additional times per season, we will be able to predict trends with more accuracy and confidence.*

In the 2005 annual report, since the chlorophyll-a concentration will have been sampled at the **THREE ISLAND** deep spot for at least 10 consecutive years, we will conduct a statistical analysis of the historic data to determine if there has been a significant change in the annual mean since monitoring began.

POT ISLAND DEEP SPOT
The current year data (the top graph) show that the chlorophyll-a concentration ***decreased slightly*** from **July** to **August**, and then ***remained relatively stable*** from **August** to **September**. The chlorophyll-a concentration on **each sampling event** was ***less than*** the state mean.

Overall, visual inspection of the historical data trend line (the bottom graph) shows a ***stabilizing*** in-lake chlorophyll-a trend which ***is much less than*** the state mean since monitoring began in **1987.**

In the 2005 annual report, since this group will have sampled the chlorophyll-a concentration at the **Pot Island** deep spot for at least 10 consecutive years, we will conduct a statistical analysis of the historic data to determine if there has been a significant change in the annual mean since monitoring began.

MOHAWK ISLAND DEEP SPOT
This deep spot was **not** sampled during 2004.

Overall, visual inspection of the historical data trend line (the bottom graph) shows a ***variable*** in-lake chlorophyll-a trend since monitoring began. Specifically, the mean concentration has ***fluctuated between approximately 1.7 and 6.6 mg/m³*** during the sampling period **1987 to 2003.** Please keep in mind that this trend is based on limited data as this deep spot was only monitored once from 1995 to 2003. As your group expands its sampling program to include additional events each year, we will be able to determine trends with more accuracy and confidence.

While algae are naturally present in all lakes/ponds, an excessive or increasing amount of any type is not welcomed. In freshwater lakes/ponds, phosphorus is the nutrient that algae depend upon for growth. Algal concentrations may increase with an increase in nonpoint sources of phosphorus loading from the watershed, or in-lake sources of phosphorus loading (such as phosphorus releases from the sediments). Therefore, it is extremely important for volunteer monitors to continually educate residents about how activities within the watershed can affect phosphorus loading and lake/pond quality.

- **Figure 2 and Table 3:** The graphs in Figure 2 (Appendix A) show historical and current year data for lake/pond transparency. Table 3 (Appendix B) lists the maximum, minimum and mean transparency data for each sampling season that the lake/pond has been monitored through the program.

  Volunteer monitors use the Secchi-disk, a 20 cm disk with alternating black and white quadrants, to measure water clarity (how far a person can see into the water). Transparency, a measure of water clarity, can be affected by the amount of algae and sediment from erosion, as well as the natural colors of the water. **The mean (average) summer transparency for New Hampshire's lakes and ponds is 3.7 meters.**

  THREE ISLAND DEEP SPOT
  The current year data (the top graph) show that the in-lake transparency in **August** was ***much greater than*** the state mean.

  Overall, visual inspection of the historical data trend line (the bottom graph) shows an ***increasing (meaning improving)*** transparency trend since monitoring began. As discussed previously, please keep in mind that this trend is based on limited data. As the monitoring group expands its sampling program to include additional events each year, we will be able to determine trends with more accuracy and confidence.

  Also, the transparency at the **THREE ISLAND** deep spot will have been monitored for at least 10 consecutive years, the 2005 annual report will include a statistical analysis of the historic data to determine if there has been a significant change in the annual mean since monitoring began.

POT ISLAND DEEP SPOT
The current year data (the top graph) show that the in-lake transparency ***increased*** from **July** to **August**, and then ***decreased*** from **August** to **September**. The transparency on **each sampling event** was ***much greater than*** the state mean.

Overall, visual inspection of the historical data trend line (the bottom graph) shows an ***increasing (meaning improving)*** transparency trend since monitoring began. As previously discussed, the transparency at the **POT ISLAND** deep spot will have been sampled at the deep spot for at least 10 consecutive years, the 2005 annual report will include a statistical analysis of the historic data to determine if there has been a significant change in the annual mean since monitoring began.

MOHAWK ISLAND DEEP SPOT
This deep spot was **not** sampled during 2004.

Overall, visual inspection of the historical data trend line (the bottom graph) shows a ***variable*** transparency trend. Specifically, the mean transparency has ***fluctuated between approximately 5.3 and 7.9 meters*** during the sampling period **1987** to **2003**. Again, please keep in mind that this trend is based on limited data.

Typically, high intensity rainfall causes erosion of sediments into lakes/ponds and streams, thus decreasing clarity. Efforts should continually be made to stabilize stream banks, lake/pond shorelines, disturbed soils within the watershed, and especially dirt roads located immediately adjacent to the edge of tributaries and the lake/pond. Guides to Best Management Practices designed to reduce, and possibly even eliminate, nonpoint source pollutants, such as sediment loading, are available from DES upon request.

- **Figure 3 and Table 8:** The graphs in Figure 3 (Appendix A) show the amount of phosphorus in the epilimnion (the upper layer) and the hypolimnion (the lower layer); the inset graphs show current year data. Table 8 (Appendix B) lists the annual maximum, minimum, and median concentration for each deep spot layer and each tributary since the lake/pond has joined the program.

  Phosphorus is the limiting nutrient for plant and algae growth in New Hampshire's freshwater lakes and ponds. Too much phosphorus in a lake/pond can lead to increases in plant and algal growth over time. **The median summer total phosphorus concentration in the epilimnion (upper layer) of New Hampshire's lakes and ponds is**

12 ug/L. The median summer phosphorus concentration in the hypolimnion (lower layer) is 14 ug/L.

THREE ISLAND DEEP SPOT
The current year data for the epilimnion (the top inset graph) and the hypolimnion (the bottom inset graph) show that the phosphorus concentration in **August** was ***less than*** the state median.

Overall, visual inspection of the historical data trend line for the epilimnion and the hypolimnion shows a ***variable*** phosphorus trend. Specifically, the epilimnetic phosphorus concentration has ***fluctuated between approximately 2 and 13 ug/L*** and the hypolimnetic phosphorus concentration has ***fluctuated between approximately 7 and 18 mg/L*** since monitoring began in ***1987.*** Please keep in mind that these trends are based on limited data.

POT ISLAND DEEP SPOT
The current year data for the epilimnion (the top inset graph) and the hypolimnion (the bottom inset graph) show that the phosphorus concentration ***increased slightly*** from **July** to **August**, and then ***decreased slightly*** from **August** to ***September***. The phosphorus concentration on **each sampling event** was ***less than*** the state median.

Overall, visual inspection of the historical data trend line for the epilimnion and the hypolimnion shows a ***slightly decreasing (meaning slightly improving)*** phosphorus trend since monitoring began in 1987.

Since the Pot Island deep spot will have been sampled for at least 10 consecutive years, the 2005 annual report will include a statistical analysis of the historic data to determine if there has been a significant change in the annual mean since monitoring began.

MOHAWK ISLAND DEEP SPOT
This deep spot was **not** sampled during 2004.

Overall, visual inspection of the historical data trend line for the epilimnion shows a ***relatively stable*** phosphorus trend which is less than the state median during the sampling period **1987** through **2003.**

Overall, visual inspection of the historical data trend line for the hypolimnion shows a ***variable*** phosphorus trend. Specifically, the mean annual concentration has ***fluctuated between approximately 9 and 64 ug/L*** during the sampling period **1987** though **2003.** Please keep in mind that these trends are based on limited data. As the sampling group expands its sampling program to include additional events each year, will be able to determine trends with more accuracy and confidence.

One of the most important approaches to reducing phosphorus loading to a waterbody is to continually educate watershed residents about its sources and how excessive amounts can adversely impact the ecology and value of lakes and ponds. Phosphorus sources within a lake or pond's watershed typically include septic systems, animal waste, lawn fertilizer, road and construction erosion, and natural wetlands.

TABLE INTERPRETATION

- **Table 2: Phytoplankton**

  Table 2 (Appendix B) lists the current and historical phytoplankton species observed in the lake/pond. Specifically, this table lists the three most dominant phytoplankton species observed in the sample and their relative abundance in the sample. In addition, this table has been enhanced this year to include the overall phytoplankton cell abundance rating of the sample. The overall phytoplankton cell abundance in a sample is calculated using a formula based on the relationship that DES biologists have observed over the years regarding phytoplankton concentrations, algal concentrations, and biological productivity in New Hampshire's lakes and ponds. A mathematical equation is used to classify the overall abundance of phytoplankton cells in a sample into the following categories: *sparse, scattered, moderate, common, abundant,* and *very abundant.* Generally, the more phytoplankton cells there are in a sample, the higher the chlorophyll concentration and the higher the biological productivity of the lake.

  THREE ISLAND DEEP SPOT

  The dominant phytoplankton species observed in the **August** sample were an unidentifiable species of **filamentous bluegreen algae, *Asterionella* (diatom), *Tabellaria* (diatom), and *Chrysosphaerella* (golden-brown).**

  The overall abundance of rating phytoplankton cells in the sample was calculated to be ***sparse.***

  POT ISLAND DEEP SPOT

  The dominant phytoplankton species observed in the **August** sample were ***Chrysosphaerella* (golden-brown),** an unidentifiable species of **filamentous bluegreen algae,** and ***Tabellaria* (diatom).**

The overall abundance of rating phytoplankton cells in the sample was calculated to be ***scattered.***

MOHAWK ISLAND DEEP SPOT
This deep spot was **not** sampled during 2004.

Phytoplankton populations undergo a natural succession during the growing season (Please refer to the "Biological Monitoring Parameters" section of this report for a more detailed explanation regarding seasonal plankton succession). Diatoms and golden-brown algae are typical in New Hampshire's less productive lakes and ponds.

- **Table 2: Cyanobacteria**

A **small amount** of the cyanobacterium ***Anabaena*** was observed in the **THREE ISLAND** and **POT ISLAND** plankton sample this season. ***This species, if present in large amounts, can be toxic to livestock, wildlife, pets, and humans.*** (Please refer to the "Biological Monitoring Parameters" section of this report for a more detailed explanation regarding cyanobacteria).

Cyanobacteria can reach nuisance levels when phosphorus loading from the watershed to surface waters is increased (this is often caused by rain events) and favorable environmental conditions occur (such as a period of sunny, warm weather).

The presence of cyanobacteria serves as a reminder of the lake's/pond's delicate balance. Watershed residents should continue to act proactively to reduce nutrient loading to the lake/pond by eliminating fertilizer use on lawns, keeping the lake/pond shoreline natural, re-vegetating cleared areas within the watershed, and properly maintaining septic systems and roads.

In addition, residents should also observe the lake/pond in September and October during the time of fall turnover (lake mixing) to document any algal blooms that may occur. Cyanobacteria have the ability to regulate their depth in the water column by producing or releasing gas from vesicles. However, occasionally lake mixing can affect their buoyancy and cause them to rise to the surface and bloom. Wind and currents tend to "pile" cyanobacteria into scums that accumulate in one section of the lake/pond. If a fall bloom occurs, please collect a sample (any clean jar or bottle will be suitable) and contact the VLAP Coordinator.

- **Table 4: pH**
  Table 4 (Appendix B) presents the in-lake and tributary current year and historical pH data.

  pH is measured on a logarithmic scale of 0 (acidic) to 14 (basic). pH is important to the survival and reproduction of fish and other aquatic life. A pH below 6.0 limits the growth and reproduction of fish. A pH between 6.0 and 7.0 is ideal for fish. The mean pH value for the epilimnion (upper layer) in New Hampshire's lakes and ponds is **6.6**, which indicates that the surface waters in the state are slightly acidic. For a more detailed explanation regarding pH, please refer to the "Chemical Monitoring Parameters" section of this report.

  The pH at the deep spot this season ranged from **6.42** in the hypolimnion to **6.76** in the epilimnion at the **THREE ISLAND DEEP SPOT,** and ranged from **6.44** in the hypolimnion to **6.76** in the epilimnion at the **POT ISLAND DEEP SPOT,** which means that the water is ***slightly acidic***

  It is important to point out that the pH in the hypolimnion (lower layer) was ***lower (more acidic)*** than in the epilimnion (upper layer). This increase in acidity near the lake bottom is likely due the decomposition of organic matter and the release of acidic by-products into the water column.

  Due to the presence of granite bedrock in the state and acid deposition (from snowmelt, rainfall, and atmospheric particulates) in New Hampshire, there is not much that can be done to effectively increase lake/pond pH.

- **Table 5: Acid Neutralizing Capacity**
  Table 5 (Appendix B) presents the current year and historical epilimnetic ANC for each year the lake/pond has been monitored through VLAP.

  Buffering capacity (ANC) describes the ability of a solution to resist changes in pH by neutralizing the acidic input. The mean ANC value for New Hampshire's lakes and ponds is **6.6 mg/L**, which indicates that many lakes and ponds in the state are at least "moderately vulnerable" to acidic inputs. For a more detailed explanation, please refer to the "Chemical Monitoring Parameters" section of this report.

  The epilimnetic Acid Neutralizing Capacity (ANC) at the **THREE ISLAND DEEP SPOT** was **5.4 mg/L,** and at the **POT ISLAND DEEP SPOT** was **7.2 mg/L**, which indicates that the lake/pond is ***moderately vulnerable*** to acidic inputs (such as acid precipitation).

- **Table 6: Conductivity**

  Table 6 (Appendix B) presents the current and historical conductivity values for tributaries and in-lake data. Conductivity is the numerical expression of the ability of water to carry an electric current (which is determined by the number of negatively charged ions from metals, salts, and minerals in the water column). The mean conductivity value for New Hampshire's lakes and ponds is **59.4 uMhos/cm**. For a more detailed explanation, please refer to the "Chemical Monitoring Parameters" section of this report.

  The epilimnetic conductivity at the **THREE ISLAND DEEP SPOT** was **95.74 uMhos/cm**, and at the **POT ISLAND DEEP SPOT** was **93.13 uMhos/cm,** both of which are ***greater than*** the state mean.

  The conductivity has ***increased*** in the lake/pond and inlets since monitoring began. Typically, sources of increased conductivity are due to human activity. These activities include septic systems, agricultural runoff, and road runoff (which contains road salt during the spring snow melt). New development in the watershed can alter runoff patterns and expose new soil and bedrock areas, which could contribute to increasing conductivity. In addition, natural sources, such as iron and manganese deposits in bedrock, can influence conductivity.

  We recommend that stream surveys and storm event sampling be conducted along the inlet(s) with ***elevated*** conductivity so that we can determine potential sources to the lake.

  For a detailed explanation on how to conduct rain event sampling and stream surveys, please refer to the 2002 VLAP Annual Report "Special Topic Article" or contact the VLAP Coordinator.

  It is possible that de-icing materials applied to nearby roadways during the winter months may be influencing the conductivity in the lake/pond. In New Hampshire, the most commonly used de-icing material is salt (sodium chloride).

  Therefore, we recommend that the **epilimnion** (upper layer) at each deep spot and the major inlets be sampled for chloride next season. This sampling may help us pinpoint what areas of the watershed which are contributing to the increasing in-lake conductivity.

  Please note that there will be an additional cost for each of the chloride samples. In addition, it is best to conduct chloride sampling in the spring soon after the snow has melted.

Also, please read this year's Special Topic Article, "Conductivity is on the rise in New Hampshire's Lakes and Ponds: What is causing the increase and what can be done?" which is found in Appendix D of this report. This article may help your association understand what types of activities can lead to elevated conductivity and chloride levels and what residents can do to minimize this type of pollution.

- **Table 8: Total Phosphorus**

  Table 8 (Appendix B) presents the current year and historical total phosphorus data for in-lake and tributary stations. Phosphorus is the nutrient that limits the algae's ability to grow and reproduce. Please refer to the "Chemical Monitoring Parameters" section of this report for a more detailed explanation.

  A ***limited amount*** of tributary sampling was conducted this season; **Collins Brook** was sampled **one time**, the **Governor Park Stream** was sampled **once**, the **Winnipesaukee River** was sampled **three times**, and **Black Brook** was sampled **three times.** The phosphorus results in each of these samples was ***relatively low*** **(20 ug/L, or less),** which is good news for the lake.

  However, we recommend that three monitoring groups coordinate sampling efforts so that the major tributaries throughout the watershed are sampled on a routine basis and during storm events.

  For a detailed explanation on how to conduct rain event sampling, please refer to the 2002 VLAP Annual Report "Special Topic Article" or contact the VLAP Coordinator.

- **Table 9 and Table 10: Dissolved Oxygen and Temperature Data**

  Table 9 (Appendix B) shows the dissolved oxygen/temperature profile(s) for the 2004 sampling season. Table 10 (Appendix B) shows the historical and current year dissolved oxygen concentration in the hypolimnion (lower layer). The presence of dissolved oxygen is vital to fish and amphibians in the water column and also to bottom-dwelling organisms. Please refer to the "Chemical Monitoring Parameters" section of this report for a more detailed explanation.

  The dissolved oxygen concentration was ***lower in the hypolimnion (lower layer) than in the epilimnion (upper layer)*** at the **THREE ISLAND** and **POT ISLAND** deep spots of the lake/pond on the **August 23** sampling event. As stratified lakes/ponds age, and as the summer progresses, oxygen typically becomes ***depleted*** in the hypolimnion by the process of decomposition. Specifically, the loss of oxygen in the hypolimnion results primarily from the process of biological breakdown of organic matter (i.e.; biological organisms use oxygen to break down organic matter), both in the water column and particularly at the bottom of the lake/pond where the water meets the sediment. When oxygen levels are depleted to less than 1 mg/L in the hypolimnion (as it has been on previous annual biologist visits at the **MOHAWK ISLAND** deep spot), the phosphorus that is normally bound up in the sediment may be re-released into the water column (a process referred to as ***internal phosphorus loading***).

- **Table 11: Turbidity**

  Table 11 (Appendix B) lists the current year and historical data for in-lake and tributary turbidity. Turbidity in the water is caused by suspended matter, such as clay, silt, and algae. Water clarity is strongly influenced by turbidity. Please refer to the "Other Monitoring Parameters" section of this report for a more detailed explanation.

  The turbidity in the **Black Brook Inlet** sample was ***slightly elevated*** (**2.54 NTUs**) on the **July** sampling event, and the turbidity in the **Governors Park Stream** was ***slightly elevated*** **(3.28 NTUs**) on the **August** sampling event. This suggests that the stream bottom may have been disturbed while sampling or that erosion is occurring in these portions of the watershed.

  When the stream bottom is disturbed, sediment, which typically contains attached phosphorus, is released into the water column. When collecting samples in the inlets, please be sure to sample where the stream is flowing and where the stream is deep enough to collect a "clean" sample.

  If erosion is suspected to be occurring in these areas of the watershed, we recommend that stream surveys and storm event sampling be conducted along these inlets. This additional sampling may allow us to determine what is causing the ***elevated*** levels of turbidity.

  For a detailed explanation on how to conduct rain event sampling and stream surveys, please refer to the 2002 VLAP Annual Report "Special Topic Article" or contact the VLAP Coordinator.

- **Table 12: Bacteria (*E.coli*)**

  Table 12 lists the current year and historical data for bacteria (*E.coli*) testing. (Please note that Table 12 now lists the maximum and minimum results for this season and for all past sampling seasons.) *E. coli* is a normal bacterium found in the large intestine of humans and other warm-blooded animals. *E.coli* is used as an indicator organism because it is easily cultured and its presence in the water, in defined amounts, indicates that sewage **MAY** be present. If sewage is present in the water, potentially harmful disease-causing organisms **MAY** also be present.

  The *E. coli* concentration was ***relatively low*** at the **Governor Park Beach** on the **August** sampling event. Specifically, the result was **29 counts per 100 mL**, which is ***less than*** the state standard of 406 counts per 100 mL for recreational surface waters that are not designated public beaches and 88 counts per 100 mL for surface waters that are designated public beaches.

- **Table 14: Current Year Biological and Chemical Raw Data**

  This table is a new addition to the Annual Report. This table lists the most current sampling season results. Since the maximum, minimum, and annual mean values for each parameter are not shown on this table, this table displays the current year "raw" (meaning unprocessed) data. The results are sorted by station, depth zone (epilimnion, metalimnion, and hypolimnion) and parameter.

- **Table 15: Station Table**

  This table is a new addition to the Annual Report. As of the Spring of 2004, all historical and current year VLAP data are included in the DES Environmental Monitoring Database (EMD). To facilitate the transfer of VLAP data into the EMD, a new station identification system had to be developed. While volunteer monitoring groups can still use the sampling station names that they have used in the past (and are most familiar with), an EMD station name also exists for each VLAP sampling location. For each station sampled at your lake or pond, Table 15 identifies what EMD station name corresponds to the station names you have used in the past and will continue to use in the future.

DATA QUALITY ASSURANCE AND CONTROL

Sample Receipt Checklist:

Each time the **THREE ISLAND** monitoring group dropped off samples at the laboratory this summer, the laboratory staff completed a sample receipt checklist to assess and document if the volunteer monitors followed proper sampling techniques when collecting the samples. The purpose of the sample receipt checklist is to minimize, and hopefully eliminate, future re-occurrences of improper sampling techniques.

Overall, the sample receipt checklist showed that this monitoring group did an ***excellent*** job when collecting samples and submitting them to the laboratory this season! Specifically, the proper field sampling procedures were followed and there was no need to rejected samples. Keep up the good work!

USEFUL RESOURCES

Acid Deposition Impacting New Hampshire's Ecosystems, NHDES Fact Sheet ARD-32, (603) 271-2975 or www.des.state.nh.us/factsheets/ ard/ard-32.htm.

Best Management Practices to Control Nonpoint Source Pollution: A Guide for Citizens and Town Officials, NHDES Booklet WD-03-42, (603) 271-2975.

Best Management Practices for Well Drilling Operations, NHDES Fact Sheet WD-WSEB-21-4, (603) 271-2975 or www.des.nh.gov/factsheets /ws/ws-21-4.htm.

Canada Geese Facts and Management Options, NHDES Fact Sheet BB-53, (603) 271-2975 or www.des.state.nh.us/factsheets/bb/bb-53.htm.

Cyanobacteria in New Hampshire Waters Potential Dangers of Blue-Green Algae Blooms, NHDES Fact Sheet WMB-10, (603) 271-2975 or www.des.state.nh.us/factsheets/wmb/wmb-10.htm.

Erosion Control for Construction in the Protected Shoreland Buffer Zone, NHDES Fact Sheet WD-SP-1, (603) 271-2975 or www.des.state.nh.us/ factsheets/sp/sp-1.htm.

Freshwater Jellyfish In New Hampshire, NHDES Fact Sheet WD-BB-5, (603) 271-2975 or www.des.state.nh.us/factsheets/bb/bb-51/htm.

Impacts of Development Upon Stormwater Runoff, NHDES Fact Sheet WD-WQE-7, (603) 271-2975 or www.des.state.nh.us/factsheets/wqe/wqe-7.htm.

IPM: An Alternative to Pesticides, NHDES Fact Sheet WD-SP-3, (603) 271-2975 or www.des.state.nh.us/factsheets/sp/sp-3.htm.

Iron Bacteria in Surface Water, NHDES Fact Sheet WD-BB-18, (603) 271-2975 or www.des.state.nh.us/factsheets/bb/bb-18.htm.

Lake Foam, NHDES Fact Sheet WD-BB-4, (603) 271-2975 or www.des.state.nh.us/factsheets/bb/bb-5.htm.

Lake Protection Tips: Some Do's and Don'ts for Maintaining Healthy Lakes, NHDES Fact Sheet WD-BB-9, (603) 271-2975 or www.des.state.nh.us/factsheets/bb/bb-9.htm.

Proper Lawn Care In the Protected Shoreland, The Comprehensive Shoreland Protection Act, NHDES Fact Sheet WD-SP-2, (603) 271-2975 or www.des.state.nh.us/factsheets/sp/sp-2.htm.

Road Salt and Water Quality, NHDES Fact Sheet WD-WMB-4, (603) 271-2975 or www.des.state.nh.us/factsheets/wmb/wmb-4.htm.

Sand Dumping - Beach Construction, NHDES Fact Sheet WD-BB-15, (603) 271-2975 or www.des.state.nh.us/factsheets/bb/bb-15.htm.

Shorelands Under the Jurisdiction of the Comprehensive Shoreland Protection Act, NHDES Fact Sheet SP-4, (603) 271-2975 or www.des.state.nh.us/factsheets/sp/sp-4.htm.

Soil Erosion and Sediment Control on Construction Sites, NHDES Fact Sheet WQE-6, (603) 271-2975 or www.des.state.nh.us/factsheets/wqe/wqe-6.htm.

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